

Research Article

The Influence Of Environmental Costing, Sustainable Performance Measurement, and Decision Making on Sustainability Management Accounting

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Abstract: This study aims to analyze the effect of Environmental Costing, Sustainable Performance Measurement, and Decision Making on Sustainability Management Accounting (SMA) in manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the period 2018–2022. The research method uses a quantitative approach with a descriptive and explanatory design. The sample was determined through a purposive sampling method with the criteria of companies that consistently publish annual reports, sustainability reports, and participate in the PROPER program. The data analysis technique used multiple linear regression with classical assumption tests such as normality, multicollinearity, heteroscedasticity, and autocorrelation. The results of the study indicate that simultaneously Environmental Costing, Sustainable Performance Measurement, and Decision Making have a negative and insignificant effect on Sustainability Management Accounting. Partially, the three independent variables also did not show a significant effect on SMA. This finding indicates that these sustainability elements have not been effectively integrated into the company's management accounting system. This study shows the need to increase management commitment and develop a more structured sustainability information system in order to support strategic decision making in line with sustainability principles.

Keywords: Decision Making; Environmental Costing; Sustainability Management Accounting; Sustainable Performance Measurement

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1. Introduction

In an era of globalization and increasing environmental awareness, companies are required not only to pursue financial gains, but also to pay attention to the impact of their operations on the environment and society at large. The need to run a responsible business has given rise to the practice of Sustainability Management Accounting (SMA). SMA plays a crucial role in providing relevant and accurate information about a company's sustainability performance, enabling management to make strategic decisions that are not only economically beneficial but also environmentally and socially responsible (Sari, 2021). However, field observations indicate that the implementation of SMA in Indonesia is still far from optimal. According to OJK data (2022), out of hundreds of issuers on the Indonesia Stock Exchange, only around 133 companies consistently publish sustainability reports, and most have not yet utilized this information in strategic decision-making. One key factor in the development of SMA is the recognition of environmental costs. These costs include expenditures related to preventing, controlling, and remediating environmental impacts resulting from company

activities (Rahmawati & Handayani, 2022). Without accurate measurement, companies risk overlooking important factors that influence their long-term sustainability. Additionally, sustainability performance measurement is a vital tool for assessing how well a company's operations align with sustainable development goals. This measurement not only focuses on environmental aspects but also encompasses social and economic dimensions (Putri & Santoso, 2023). The results form the basis for continuous evaluation and improvement of business practices. Strategic decisions that consider sustainability data can enhance the effectiveness of SMA implementation, identify innovation opportunities, and strengthen the company's reputation (Mulyani, 2022).

Research Questions

1. Does Environmental Costing have a positive and significant impact on Sustainability Management Accounting?
2. Does Sustainable Performance Measurement have a positive and significant impact on Sustainability Management Accounting?
3. Does Decision Making have a positive and significant impact on Sustainability Management Accounting?
4. Do Environmental Costs, Sustainable Performance Measurement, and Decision Making have a positive and significant impact on Sustainability Management Accounting (SMA)?

2. Literature Review

Sustainability Management Accounting (SMA)

The definition of sustainability management accounting (SMA) is a part of accounting and reporting related to recording activities, methods, and systems, as well as analysis and reporting on three things: first, financial impacts related to the environment and society; second, ecological and social impacts defined within an economic system (e.g., companies, production facilities, countries, and others), and third, sustainability accounting and reporting related to the measurement, analysis, and interaction and communication between social, environmental, and economic issues, which are dimensions of sustainability.

Environmental Costing

Environmental costs include internal and external costs and relate to all costs incurred in connection with environmental damage and protection. Environmental costs can also be defined as costs incurred due to poor environmental quality or the possibility of poor environmental quality, which consist of costs incurred for environmental damage prevention activities, environmental detection/monitoring activities, and waste treatment activities (internal failures), and activities to restore environmental damage around the company caused by the company's business activities (external failures).

Sustainable Performance Measurement

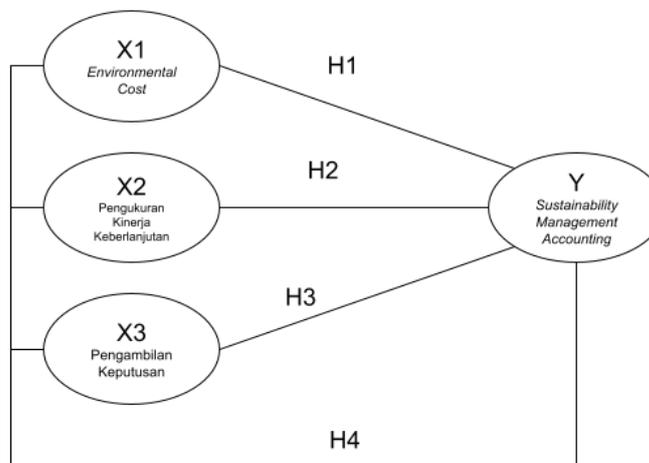
Sustainable performance measurement is a multidimensional approach that aims to assess an organization's achievements not only from an economic perspective, but also from a balanced social and environmental perspective. This concept is rooted in the Triple Bottom Line theory, which emphasizes the importance of paying attention to the three main pillars of sustainability: profit (economic), people (social), and planet (environment). In practice, this measurement can be carried out through various frameworks such as the Global Reporting Initiative (GRI), Environmental, Social, and Governance (ESG) metrics, or the Sustainability Balanced Scorecard, which provide quantitative and qualitative indicators to assess an organization's impact and contribution to sustainable development.

Decision Making

The Great Dictionary of Science explains that decision making is defined as the selection of decisions or policies based on certain criteria. The process is divided into two or more alternatives. A decision is the result or output of a mental or cognitive process in selecting an action among several alternative choices. Decision making is an absolute necessity in the life of a group in general. Risk management involves the identification, analysis, evaluation, and

control of risks. All of these stages require appropriate decision making. The decisions made will determine the organization's strategy in avoiding, reducing, or accepting risks.

Conceptual Framework



3. Proposed Method

This study uses a quantitative approach with descriptive or explanatory methods. Quantitative methods use statistical analysis to test research hypotheses. This approach is used to measure the variables under study numerically and analyze the relationships between variables using statistical techniques.

Population and Sample

The population in this study consists of manufacturing companies listed on the Indonesia Stock Exchange (IDX) from 2018 to 2022, totaling 178 companies. Sampling was conducted using purposive sampling with the following criteria:

1. Manufacturing companies listed on the Indonesia Stock Exchange (IDX) from 2018 to 2022.
2. Companies that published annual reports and sustainability reports regularly during the 5 (five) year research period, namely from 2018 to 2022.
3. Companies that participated in the PROPER ranking on a regular basis during the research period, i.e., 2018-2022.

Based on the above criteria, the sample that met the criteria consisted of 10 companies, resulting in a total of 168 companies observed over the 5-year period.

Data Sources and Collection Techniques

The data sources in this study are secondary data. The reports used include financial statements, sustainability reports, annual reports, and PROPER rankings of manufacturing companies listed on the Indonesia Stock Exchange (IDX) from 2018 to 2022. The data sources used are financial statements and annual reports of companies listed on the IDX. Data was obtained from the IDX website and the websites of each company.

4. Results and Discussion

Result

This study analyzes the effect of environmental costs and environmental performance on financial performance in manufacturing companies listed on the IDX for the period 2018-2022. The results of the data testing can be seen in the explanation below:

Normality Test

Table 1: One-Sample Kolmogorov-Smirnov Test

			Unstandardized Residual
N			10
Normal Parameters ^{a,b}	Mean		,0000000
	Std. Deviation		,01868401
Most Extreme Differences	Absolute		,131
	Positive		,128
	Negative		-,131
Test Statistic			,131
Asymp. Sig. (2-tailed)			,200 ^{c,d}

Referring to the decision criteria from the normality test, it is known that the residuals in the regression model are normally distributed, because the significance value produced is 200, which is much greater than 0.05 (α). Thus, one of the regression test requirements has been met.

Multicollinearity Test

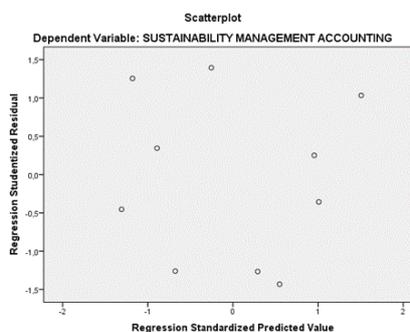
The results of the testing using the SPSS 22.0 program are presented in Table 2 below:

Table 3: Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	Environmental Cost	,866	1,154
	Pengukuran Kinerja Keberlanjutan	,570	1,756
	Pengambilan Keputusan	,635	1,574

From the results presented in the table above, it can be concluded that in the regression model formed, there were no multicollinearity issues, because all independent variables included in the model had tolerance values greater than 0.10 and VIF values less than 10, so the assumption of being free from multicollinearity issues was fulfilled.

Heteroscedasticity Test



In the graph above, it can be seen that the points are scattered randomly and do not form a pattern. This result shows that the regression model to be formed is free from heteroscedasticity.

Autocorrelation Test

Data Observasi (n)	k	dU	Durbin Watson	4-dU	Kesimpulan
10	3	2,016	2,626	1,984	Tidak Terjadi Autokorelasi

The dU value used as the critical value in this test was obtained from the Durbin Watson table with 10 observations and 3 independent variables. From the test results presented in the table, it is known that the Durbin Watson value obtained is between du and 4-du ($2.016 < 2.626 < 1.984$). Therefore, it can be concluded that the regression model to be formed is free from autocorrelation issues, thus meeting one of the assumptions required for regression testing.

Multiple Linear Regression Analysis

The results of the multiple regression analysis can be seen in Table 3 below:

Table 3: Coefficients^a

Model		Unstandardized Coefficients		Standardize d Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,169	,081		2,095	,081
	Environmental Cost	-,436	,367	-,439	-1,189	,279
	Pengukuran Kinerja Keberlanjutan	,000	,001	-,209	-,459	,663
	Pengambilan Keputusan	,000	,009	-,012	-,029	,978

From Table 3, the regression model equation can be expressed as follows:

$$SMA = 0.169 - 0.436 X1 + 0.000 X2 + 0.000 X3$$

From the regression equation above, it is evident that X1 and X2 have positive regression coefficients, indicating that higher ratios of X1 and X2 rankings lead to an increase in the value of SMA (Sustainability Management Accounting). The table above indicates the significance of the relationship between the dependent variable and the independent variables. As can be seen in the table, variable (X3) is significantly associated with X1 and X2 ($0.081 < 5\%$).

Simultaneous Test (F Test)

Table 4: Anova^a

Model	Sum Of Squares	Df	Mean Square	F	Sig.
Regression	,001	3	,000	,826	,526 ^b
Residual	,003	6	,001		
Total	,004	9			

Based on Table 4, the F-test results show that the sig value is 0.005, which is greater than the significance level of 0.05, or $0.005 < 0.05$. Therefore, all independent

variables simultaneously have a significant effect on the dependent variable, which is proxied by SMA (Sustainability Management Accounting).

Determination Coefficient Test (R²)

Table 5: Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,541 ^a	,292	-,061	,02288

Based on Table 5, the results of the coefficient of determination test (Adjusted R Square) of -0.061 indicate that the independent variables in this study can predict the dependent variable in the form of SMA (Sustainability Management Accounting) by 9.1 percent, while the remaining 90.9 percent is influenced by variables or factors outside the scope of this study.

Discussion

The Influence of Environmental Costs, Sustainable Performance Measurement, and Decision Making on Sustainability Management Accounting (SMA)

Based on the F-test, environmental costs, sustainable performance measurement, and simultaneous decision-making have a negative but insignificant effect on Sustainability Management Accounting (SMA). Although environmental costs are taken into account, their influence is not yet strong enough to significantly encourage the implementation of SMA. This indicates that companies still tend to view environmental costs as a burden rather than a strategic element in decision-making. Thus, the relationship between the three variables and SMA has not been statistically proven.

The Influence of Environmental Costs and Sustainability Management Accounting (SMA)

Environmental costs have a negative and insignificant effect on Sustainability Management Accounting (SMA). These findings indicate that environmental costs are not yet viewed as strategic investments, but rather as additional obligations. This is likely due to a lack of understanding or commitment on the part of management regarding the importance of integrating environmental costs into sustainable accounting systems. A more integrated approach is needed so that environmental costs can optimally support the implementation of SMA.

The Influence of Sustainable Performance Measurement and Sustainability Management Accounting (SMA)

Sustainable Performance Measurement has a negative and insignificant effect on Sustainability Management Accounting (SMA). This indicates that the measurements taken have not been fully integrated into the management accounting system. The causes may include inconsistencies in indicators, insufficient utilization of measurement results in decision-making, and the company's continued focus on financial aspects. Although theoretically supportive of SMA, its impact has not been proven to be significant in this study.

The Influence of Decision Making and Sustainability Management Accounting (SMA)

Decision-making has a negative and insignificant effect on Sustainability Management Accounting (SMA). This is because management decisions do not fully consider sustainability aspects comprehensively. Short-term orientation and focus on profit are still dominant, while the integration of sustainability data in the decision-making process is not yet optimal. As a result, decision-making has not been able to effectively promote the implementation of SMA.

Conclusions and Suggestions

Conclusions

Based on the research results, Environmental Costing, Sustainable Performance Measurement, and Decision Making simultaneously have a negative and insignificant effect on Sustainability Management Accounting (SMA) in manufacturing companies listed on the Indonesia Stock Exchange for the period 2018–2022. These findings indicate that the implementation of sustainability in managerial accounting has not yet become a strengthening factor in overall organizational management. Environmental Costs have a negative and insignificant effect on SMA. This indicates that environmental costs are not yet considered a strategic investment in sustainable management accounting practices, so this hypothesis is not supported by empirical data. Sustainability Performance Measurement also has a negative and insignificant effect on SMA. This means that although measurements have been conducted, the results have not been effectively integrated into the management accounting system, so this hypothesis is not significantly proven. Decision-making has a negative and insignificant effect on SMA. Managerial decisions have not fully considered sustainability aspects, and sustainability information has not become the basis for corporate strategy. Therefore, this hypothesis is also not proven. Simultaneously, the three variables are not strong enough to drive the actual implementation of SMA, so the simultaneous hypothesis is also not supported empirically.

Suggestions

Manufacturing companies that are vulnerable to environmental impacts need to allocate special funds for environmental costs in order to control environmental management activities. Participation in PROPER is also important for monitoring environmental performance and supporting sustainability and improved financial performance. Further research is recommended to expand the subject not only to the manufacturing sector, but also to other sectors such as basic materials. Additionally, other independent variables such as CSR disclosure, company size, and environmental information can be added for a more comprehensive analysis.

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